

## IN THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

### Listing of Claims:

- 1 Claim 1. (*Original*) A hydrant knock-off flow stop valve comprising:
  - 2 a generally cylindrical, vertically oriented, bulbous wall defining a central, vertical axis;
  - 3 an upper flange having circumferential recess so located as to receive a break ring for
  - 4 breakaway attachment of the lower flange of a wet hydrant;
  - 5 a lower flange for connection with a fluid system supply riser.
  - 6 a plurality of vertically disposed, circumferentially spaced vanes extending radially inward from
  - 7 said bulbous wall, said vanes having inner edges defining vertically oriented guides, said guides defining
  - 8 a generally cylindrical valve member guide;
  - 9 said bulbous wall forming a circumferential upper valve seat spaced below said upper flange
  - 10 along the interior wall thereof;
  - 11 a valve element free for vertical movement within said generally cylindrical valve member guide
  - 12 and so configured as to seal against said upper valve seat, closing upward flow of fluid through said
  - 13 valve; and
  - 14 a valve element restraining cage located in the upper portion of said valve, said cage having a
  - 15 centrally located valve member seat, a circumferential cage retaining ring spaced upward from said

16 valve member seat, and a plurality of radially spaced cage legs extending between said valve member  
17 seat and said cage retaining ring;  
18           said upper flange defining an inner upward-opening cage retaining ring groove;  
19           said valve element restraining cage having said circumferential cage retaining ring removably  
20 located within said upward-opening cage retaining ring groove, said valve member seat being spaced  
21 below said upper circumferential seat by said plurality of spaced cage legs;  
22           whereby, system water flows through the riser, upward between said vanes, through said cage  
23 legs, and through said upper flange for supply of water to the wet hydrant; and  
24           whereby, upon the hydrant being accidentally impacted such that the break ring shears, water  
25 pressure acts upon said valve element, driving said cage upward, away from said valve and allowing  
26 said valve element to travel upward to said upper circumferential seat, forming a seal therewith and  
27 stopping water flow through said valve.

1       Claim 2. (*Original*) The valve of claim 1, further comprising a circumferential lower valve seat ring  
2 mounted on the inner circumference of said lower valve flange and defining a circumferential lower  
3 valve seat at the upper end thereof;  
4           whereby, upon a backpressure event occurring in said valve, said valve element engages said  
5 lower seal by action of gravity and fluid pressure, acting as a check valve against backflow of fluid into  
6 the riser and supply system.

1    Claim 3. (*Original*) The valve of claim 1, wherein the inner side of said upper flange slopes upward  
2    and outward, and said cage legs extend upward and outward from said valve element seat and fit  
3    against and are partially supported by the inner side of said upper flange.

1    Claim 4. (*Original*) The valve of claim 3, wherein said valve element restraining cage restraining ring  
2    is held in place by said hydrant flange and said valve element restraining cage restraining ring is freed  
3    upon separation of said hydrant from said valve upper flange, allowing said restraining cage to separate  
4    from said valve, allowing said valve element to lift and stop fluid flow.

1    Claim 5. (*Original*) The valve of claim 1, wherein said valve element is in the form of a ball or globe.

1    Claim 6. (*Original*) The valve of claim 5, wherein said valve element is a hollow sphere having a  
2    covering of a soft plastic layer.

1    Claim 7. (*Original*) The valve of claim 6, wherein said valve element is made of cast iron.

1    Claim 8. (*Original*) The valve of claim 1, wherein said valve element comprises:  
2            a double ended valve element having upper and lower mushroom elements, having an upper,  
3            mushroom shaped upper surface and a lower, inverted mushroom shape lower surface, respectively,

4 each of said upper and lower mushroom shape elements having supporting stems having respective  
5 mushroom inner ends and free ends and defining axial recesses extending along their respective lengths,  
6 a common, vertical axial support shaft having a separation plate mounted along the length  
7 thereof at about the longitudinal center, said supporting stems being slidingly mounted over said  
8 common vertical axial support shaft and toward said separation plate; and  
9 coaxial coil springs extending from said separation plate to the respective inner ends of said  
10 stems;  
11 whereby upon said hydrant if broken away at its lower flange by the shearing of said break  
12 ring, and the separation of said support cage, said upper mushroom element is forced upward under  
13 spring pressure to seal against said upper circumferential upper seal.

1 Claim 9. (*Original*) The valve of claim 2, wherein said valve element comprises:  
2 a double ended, upper and lower double mushroom elements, having an upper, mushroom  
3 shape upper surface and a lower, inverted mushroom shape lower surface, each said upper and lower  
4 mushroom shape elements having supporting stems having respective mushroom inner ends and free  
5 ends and defining axial recesses extending along their respective lengths,  
6 a common, vertical axial support shaft longitudinal center, said supporting stems slidingly  
7 mounted through their respective free ends over said common vertical axial support shaft; and  
8 a coaxial coil spring extending coaxially over said stems between said mushroom element inner

9 ends;

10 whereby, upon said hydrant being broken away at its lower flange by the shearing of said break  
11 ring, and the separation of said support cage, said upper mushroom element is forced by spring  
12 pressure to seal against said upper circumferential upper seal.

1 Claim 10. (*Original*) The valve of claim 8, further comprising a circumferential lower valve seat ring  
2 mounted on the inner circumference of said lower valve flange and defining a circumferential lower  
3 valve seat at the upper end thereof;

4 whereby, upon a backpressure event occurring within said valve, said valve element engages  
5 said lower seal by action of spring and fluid pressure, said valve acting as a check valve against  
6 backflow of fluid into the riser and supply system.

1 Claim 11. (*Original*) The valve of claim 9, further comprising a circumferential lower valve seat ring  
2 mounted on the inner circumference of said lower valve flange and defining a circumferential lower  
3 valve seat at the upper end thereof;

4 whereby, upon a backpressure event occurring within said valve, said valve element engages  
5 said lower seal by action of spring pressure and fluid pressure, acting as a check valve against backflow  
6 of fluid into the riser and supply system.

1       Claim 12. (*Original*) A hydrant knock-off flow stop valve comprising:

2            a generally cylindrical, vertically oriented, bulbous wall defining an central, vertical axis;

3            an upper flange having a circumferential recess so located as to receive a break ring for

4            breakaway attachment to the lower flange of a wet hydrant;

5            a lower flange for connection with a fluid system supply riser;

6            said bulbous wall being split at its midsection into upper and lower generally hemispheric outer

7            walls having engaging flanges;

8            a valve element support spider having an axially located hub, an outer circular rim, and a

9            plurality of spider spokes extending between said hub and said rim and spaced radially therearound;

10            said outer wall engaging flanges forming corresponding inner half-grooves at their intersection,

11            said outer circular rim being supported within the groove formed by said half-grooves when said flanges

12            are mated;

13            a vertical, axial support shaft supported by and extending axially at least upward from said

14            axially located hub, forming an upper portion thereof;

15            said valve element comprising a first upper mushroom valve element, said upper mushroom

16            valve element having a mushroom shaped, generally hemispheric, upper surface and having a

17            downward extending supporting stem having an inner end and a free end and defining an axial recess

18            therein, said free end extending over and slidingly engaging said upper portion of said axial support

19            shaft, said upper mushroom valve element having a coil spring surrounding said stem from said inner

20 end to said support spider hub;

21       said upper hemispheric wall forming a circumferential upper valve seat spaced below said

22       upper flange along the interior wall thereof, said valve seat forming a seal upon engaging said mushroom

23       shaped upper surface of said upper valve element so as to stop fluid flowing upward through said valve;

24       and

25       a valve element restraining cage located in the upper portion of said valve, said cage having a

26       centrally located valve member seat, a circumferential cage retaining ring spaced upward from said

27       valve member seat, and a plurality of radially spaced cage legs extending between said valve member

28       seat and said cage retaining ring;

29       said upper flange defining an inner upward-opening cage retaining ring groove;

30       said valve element restraining cage having said circumferential cage retaining ring removably

31       located within said upward-opening cage retaining ring groove, said valve member seat being spaced

32       below said upper circumferential seat by said plurality of spaced cage legs; and

33       said upper mushroom valve being driven by spring pressure and fluid pressure against said

34       upper seal upon said hydrant flange breaking away and said restraining cage lifting from said upper

35       flange by fluid and spring pressure;

36       whereby, system water flows through the riser, upward between said vanes, through said cage

37       legs, and through said upper flange for supply of water to the wet hydrant; and

38       whereby, upon the hydrant being accidentally impacted such that the break ring shears, fluid

39 and spring pressure acts upon said valve element, driving said cage upward, away from said valve and  
40 allowing said valve element to travel upward to said upper circumferential seat, forming a seal therewith  
41 and stopping water flow through said valve.

1 Claim 13. (*Original*) The valve of claim 12, said axial support shaft extending axially below said axial  
2 support spider hub, said valve element comprising a second, lower inverted mushroom valve element,  
3 said lower mushroom valve element having a mushroom shaped, generally hemispheric, lower surface  
4 and having an upward extending supporting stem having an inner end and a free end and defining an  
5 axial recess therein, said free end extending over and slidably engaging said lower portion of said axial  
6 support shaft, said lower mushroom valve element having a coil spring surrounding said stem from said  
7 inner end to said support spider hub;

8           said lower flange of said valve having a circumferential lower valve seat ring mounted on the  
9 inner circumference of said lower valve flange and defining a circumferential lower valve seat at the  
10 upper end thereof, said lower seat sealing against flow of fluid upon said lower mushroom valve element  
11 surface engaging said lower seat;

12           whereby, upon a backpressure event occurring within said valve, said valve element engages  
13 said lower seal by action of spring and fluid pressure, the valve acting as a check valve against  
14 backflow of fluid into the riser and supply system.

1    Claim 14. (*Original*) The valve of claim 12, wherein the inner side of said upper flange slopes upward  
2    and outward, and said cage legs extend upward and outward from said valve element seat and fit  
3    against and are partially supported by the inner side of said upper flange.

1    Claim 15. (*Original*) The valve of claim 14, wherein said valve element restraining cage restraining ring  
2    is held in place by said hydrant flange and said valve element restraining cage restraining ring is freed  
3    upon separation of said hydrant from said valve upper flange, allowing said restraining cage to separate  
4    from said valve, and allowing said valve element to lift and stop fluid flow.

1    Claim 16. (*Original*) The valve of claim 12, wherein said upper mushroom surface is covered with  
2    a soft plastic layer.

1    Claim 17. (*Original*) The valve of claim 13, wherein said lower mushroom surface is covered with a  
2    soft plastic layer.

1    Claim 18. (*Original*) The valve of claim 13, wherein the inner side of said upper flange slopes upward  
2    and outward, and said cage legs extend upward and outward from said valve element seat and fit  
3    against and are partially supported by the inner side of said upper flange.

- 1    Claim 19. (*Original*) The valve of claim 18, wherein said valve element restraining cage restraining ring
- 2    is held in place by said hydrant flange and said valve element restraining cage restraining ring is freed
- 3    upon separation of said hydrant from said valve upper flange, allowing said restraining cage to separate
- 4    from said valve, allowing said valve element to lift under spring pressure and stop fluid flow.

Claim 20. (*Cancelled*)